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Variation of growth rate of Oriya Urban Children from the Children of different part of India

Usha Deka
and
Basanti Rath

Introduction

The present paper is based on the semi-longitudinal studies of the growth and development of Oriya urban children of Orissa. In order to find out the rate of growth between 8 to 16 years, the subjects within the age group 8—16 years, different measurements were taken on a subject, four times each at six months interval. An attempt is made to study how the growth trends of different divisions of Oriya urban children vary from Maharastrian boys and girls studied by Dr. Sharma (1970) and Punjabi Hindu Khatri boys by Dr. Singh (1970).

Materials and Method

The sample consists of 2,332 Oriya urban children from different schools of Orissa. Out of 2,332 children, there are 1,172 boys and 1,160 girls. The growth trends of the Oriya Urban boys and girls are compared with the Maharastrian boys and girls and Punjabi Hindu Khatri boys only. Few characters, such as stature, weight, chest breadth, chest depth, bicristal breadth, sitting height and biacromial breadth of the boys and girls of the present samples are compared with those of Maharastrian boys and girls. Stature, weight, sitting height and bicristal breadth of the Oriya urban boys are compared with those of Punjabi Hindu Khatri boys.

Results

Comparision with Maharastrian children :

It has been observed that all the groups except the age-groups 8-9 years, 12-13 years, 13-14 years and 14-15 years, the stature of Maharastrian boys is higher than the stature of Oriya boys. At all the age-groups except the age-group 11-12 years, 12-13 years, 13-14 years, the rate of growth of the stature of Oriya boys is higher than that of Maharastrian boys.

In case of girls the mean stature of Oriya girls is higher than that of the Maharastrian girls, at the age-groups 12-13 years, 13-14 years, 14-15 years and 15-16 years. It is observed that, at all the age-groups except the age-groups 10-11 years, 12-13 years, the rate of growth of stature of Maharastrian girls is higher than that of Oriya girls.

It is seen that, at all the age-groups except the age-groups 8-9 years, 11-12 years and 12-13 years, the weight of Maharastrian boys is higher than that of Oriya boys. But in case of girls at all the age-groups, the weight of Maharastrian girls is higher than that of Oriya girls.

At all the age-groups except the-age groups 8-9 years, 9-10 years, 13-14 years, the chest girth of Oriya boys is higher than that of Maharastrian boys. In case of girls the mean chest girth at all the age-groups of Oriya girls is higher than the mean chest girth of Maharastrian girls. At all the age-groups the mean chest breadth of Oriya boys as well as that of girls are higher than those of Maharastrian boys and girls.

In case of boys at all the age-groups except the-age groups 8-9 years and 9-10 years, the chest depth of Maharastrian boys is higher than that of Oriya boys. In case of girls the chest depth of Maharastrian girls is higher than that of Oriya girls at all the age-groups.

The comparison of the bicristal breadth of both the groups shows that, among the boys, at all the age-groups except at the age-groups 8-9 years, 14-15 years and 15-16 years, the bicristal breadth of Oriya boys is higher than the Maharastrian boys. In case of girls at all the age-groups the bicristal breadth of Maharastrian girls is higher than the bicristal breadth of Oriya girls.

The comparison of the bicristal breadth of both the groups shows that, among the boys, at all the age-groups except at the age-groups 8-9 years, 14-15 years and 15-16 years, the bicristal breadth of Oriya boys is higher than the Maharastrian boys. In case of girls at all the age-groups the bicristal breadth of Maharastrian girls is higher than the bicristal breadth of Oriya girls.

It is observed that, at all the age-groups except at the age-groups 8-9 years, 12-13 years and 15-16 years, the sitting height of Oriya girls, is higher than the sitting hight of Maharastrian girls.

At all the age-groups except at the age-groups 13-14 years, the biacromial breadth of Maharastrian boys is higher than the biacromial breadth of Oriya boys. In case of girls, at all the age-groups except the age-groups 13-14 years and 14-15 years, the biacromial breadth of Maharastrian girls is higher than the Oriya girls. From the comperison and computation of 't' value to find out the difference it is observed that the Oriya urban girls do not differ much from the Maharastrian girls, both in stature and weight. The Oriya boys possess significantly higher stature. In other characters the differences between these two groups are not very remarkable.

A few characters such as stature, weight, sitting height and bicristal breadth of Oriya boys are compared with those of Punjabi Hindu Khatri boys. It is observed that at all the age-groups, the stature of Punjabi Hindu Khatri boys is higher than the stature of Oriya urban boys. The comparision of weight of the boys of both the groups shows that at all the age-groups the weight of Punjabi Hindu Khatri boys is higher than that of the Oriya boys. At all the age-groups except the age-groups 11-12 years, 13-14 years, 15-16 years, the sitting height of Oriya boys is higher than that of Punjabi Hindu Khatri boys. At all the age-groups, the bicristal breadth of Oriya boys is higher than that of Punjabi Hindu Khatri boys.

From the above observations one can conclude that the Oriya children, both girls and boys, do not demonstrate much difference in the growth trends from the Maharastrian boys and girls. But they definitely show differences in growth trends from the Punjabi Hindu Khatri boys at Delhi. They are shorter and weighter than the Punjabi boys. On the other hand Oriya boys present greater breadth measurements in comparison to Punjabi boys.

ANNEXURE I

Mean Stature of Oriya and Maharastrian Girls

Age-Group	Oriya				Maharashtrian				't'
	No.	Mean ± (In cms.)	S. E. of Mean	Rate of Growth (In %)	No.	Mean ± (In cms.)	S. E. of Mean	Rate of Growth (In %)	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
8-9 years ..	70	119·50	1·02	..	17	120·00	1·31	4·0	0·37
9-10 years ..	73	124·25	0·58	3·97	20	126·00	1·24	6·8	1·28
10-11 years ..	75	131·00	0·25	5 43	12	131·00	1·33	3·9	0·07
11-12 years ..	72	138·88	0·80	6·01	15	139·90	1·31	6·4	0·66
12-13 years ..	78	146·12	0·65	5·21	21	144·40	0·75	3·0	1·75
13-14 years ..	70	149·20	0·95	2·10	13	147·40	1·56	2·1	0·88
14-15 years ..	70	151·00	1·22	1·20	15	150·80	1·18	2·2	0·11
15-16 years ..	72	152·30	0·99	0·86	14	151·80	0·97	2·0	0·36

ANNEXURE II

Mean Weight of Oriya and Maharastrian Girls

Age Group	Oriya				Maharashtrian				't'
	No.	Mean ± (In Kgs.)	S. E. of Mean	Rate of Growth (In %)	No.	Mean ± (In Kgs.)	S. E. of Mean	Rate of Growth (In %)	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
8-9 years ..	70	19·20	0·60	..	17	19·7	0·45	7·3	0·67
9-10 years ..	73	20·00	0·62	4·1	20	21·8	0·43	10·1	1·78
10-11 years ..	75	21·98	1·00	9·9	12	25·4	1·14	15·4	2·28**
11-12 years ..	72	25·00	0·78	13·7	15	27·9	0·87	9·4	2·41**
12-13 years ..	76	28·96	0·72	15·8	21	30·8	0·73	9·9	1·97
13-14 years ..	70	33·15	0·85	14·4	13	34·3	1·27	10·7	0·82
14-15 years ..	70	35·00	0·82	5·59	15	38·0	0·95	10·2	1·80
15—16 years ..	72	39·95	0·78	10·97	14	40·0	0·89	5·11	0·04

**Significant at 5 pc. level

ANNEXURE III

Mean Chest Girth of Oriya and Maharastrian Boys

Age-Group	Oriya				Maharastrian				't'
	No.	Mean (In Cms.)	S. E. of Mean	Rate of Growth (In %)	No.	Mean (In Cms.)	S. E. of Mean	Rate of Growth (In %)	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
8-9 Years ..	70	54·98	0·22	..	16	55.0	0·48	2·2	0·03
9-10 Years ..	75	56·20	0·50	2·21	12	56·5	1·05	2·8	0·25
10-11 Years ..	72	58·65	0·05	4·35	29	57·5	0·64	1·8	1·82
11-12 Years ..	70	60·80	0·47	3·65	18	59·4	0·53	3·2	2·00**
12-13 Years ..	76	64·46	0·16	6·01	20	63·7	0.66	7·0	1·13
13-14 Years ..	70	67·95	0·76	5·41	18	68·0	1·00	6·5	0·04
14-15 Years ..	70	72·50	0·72	6·69	20	69·8	0·89	2·8	2·36**
15-16 Years ..	72	76·10	0·62	4·89	18	72·7	0·61	4·0	3·95*

*Significant at 1 pc. level

**Sinificant at 5 pc. level

ANNEXURE IV

Mean Chest Girth of Oriya and Maharastrian Girls

Age Group	Oriya				Maharastrian				't'
	No	Mean ± (In Cms.)	S. E. of Mean	Rate of Growth (In %)	No	Mean ± (In Cms.)	S. E. of Mean	Rate of Growth (In %)	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
8-9 Years ..	70	55·00	0·32	..	17	53·6	1·08	3·5	1·18
9-10 Years ..	73	57·28	0·42	4·09	20	54·9	0·94	2·2	2·40**
10-11 Years ..	75	59·52	0·30	2·31	12	56·5	1·28	3·0	1·56

** Significant at 5 pc. eval

ANNEXURE V

Mean Chest Breadth of Oriya and Maharastrian Boys

Age Group	Oriya				Maharastrian				't'
	No	Mean ± (In Cms.)	S. E. of Mean	Rate of Growth (In %)	No	Mean ± (In Cms.)	S. E. of Mean	Rate of Growth (In %)	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
8-9 Years ..	70	19·70	0·16		16	17·60	0·17	1·5	9·50*
9-10 Years ..	75	20·00	0·07	1·52	16	13·00	0·26	1·1	8·33*
10-11 Years ..	72	21·00	0·22	5·00	12	18·86	0·16	4·6	8·56*
11-12 Years ..	70	21·50	0·01	2·38	29	19·52	0·31	3·4	5·60*
12-13 years ..	76	22·18	0·18	3·16	18	19·89	0·28	1·8	7·83*
13-14 Years ..	70	23·50	0·31	5·95	20	20·80	0 19	4·4	9·00*
14-15 Years ..	70	23·96	0·50	1·91	18	21·77	0·27	4·5	3·89*
15-16 Years ..	72	25·90	0·14	8·14	20	22·52	0·49	3·3	6·78*

* Significant at 1 Pc. level

ANNEXURE VI

Mean Chest Breadth of Oriya and Maharastrian Girls

Age Group	Oriya				Maharastrian				't'
	No	Mean (In Cms.)	S. E. of Mean	Rate of Growth (In %)	No	Mean (In Cms.)	S. E. of Mean	Rate of Growth (In %)	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
8-9 Years ..	70	18·10	0·60	..	17	17·70	0·18	1·7	0·76
9-10 Years ..	73	19·00	0·39	4.97	20	17·69	0·22	1 0	2·64*
10-11 Years .	75	18·65	0·65	3·42	12	18·56	0·44	3·6	1·39
11-12 Years ..	72	19·95	0.82	1·62	16	19·10	0·35	2·8	0·96
12-13 Years ..	76	20·88	0·65	4·66	21	20·00	0·27	4·8	1·26

* Significant at 1 pc. level

ANNEXURE-VII

Mean Chest depth of Oriya and Maharastrian Boys.

Age-Group	Oriya				Maharastrian				't'
	No	Mean ± (In cms.)	S. E. of Mean.	Rate of Grow t h (In %)	No.	Mean ± (In cms.)	S. E. of Mean	Rate of Growth (In%).	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
8-9 years	70	13·35	0·20	..	16	13·00	0·39	2·3	0·81
9-10 years	75	13·56	0·15	3·82	12	13·35	0·40	6·3	0·02
10-11 years	72	14·20	0.16	2·45	29	14·72	0·19	6·1	2.35**
11-12 years	70	14·58	0·15	2·67	18	14·33	0·42	1·4	0·81
12-13 years	76	15·20	0·22	4·25	20	15·81	0·35	5·7	1·52
13-14 years	70	15.57	0·20	4·40	18	16·00	0·50	1·1	0·24
14-15 years	70	16·26	0·25	2·68	20	16·67	0·63	12·2	0·13
15-16 years	72	16·95	0·15	4·11	18	17·02	0·49	3·8	0.14

** Significant at 5 pc. level

ANNEXURE-VIII

Mean chest depth of Oriya and Maharastrian Girls.

Age-Group	Oriya No	Mean ± (In cms.)	S. E. of Mean.	Rate of Growth (In %)	Maharastrian No	Mean ± (In cms.)	S. E. of Mean.	Rate of Growth (In %)	't'
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
8—9 years	70	12·81	0.30	..	17	13·49	0·30	4·4	1·88
9—10 years	73	13·16	0·55	2·65	20	14·00	0·23	3·7	1·44
10—11 years	75	13·40	0·20	1·90	12	14·29	0·27	2·0	2·69
11—12 years	72	14·00	0·18	4·47	15	15·00	0·20	4·8	3·84*
12—13 years	76	14·65	0·26	4·64	21	15·40	0·22	2.8	2·7**

* Significant at 1 pc. level

** Significant at 5 pc. level.

ANNEXURE-IX

Mean Bicristal Breadth of Oriya and Maharastrian Girls

Age-Group	Oriya No	Mean ± (In cms.)	S. E of Mean	Rate of Growth (In %)	Maharastrian No	Mean ± (In cms.)	S. E. of Mean	Rate of Growth (In %)	't'
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
8—9 years ..	70	19·95	0·30	..	17	20·90	0·28	8·5	2·66**
9—10 years ..	73	20·42	0·65	2·35	20	20·20	0·42	6·0	2·34**
10—11 years ..	75	20·77	0·65	1·71	12	23·65	0·42	6·3	4·23*
11—12 years ..	72	21·42	0·40	3·12	15	25·00	0·42	5·5	6·28*
12—13 years ..	76	23·00	0·28	7·37	21	25·00	0·51	2·3	4·56*
13—14 years ..	70	23·86	0·38	3·73	13	26·60	0·60	3·8	4·00*
14—15 years ..	70	24·42	0·42	2·34	15	27·60	0·40	4·4	5·92*
15—16 years ..	72	25·92	0·48	6·14	14	29·20	0·44	4·9	5·12*

*Significant at 1 pc. level

**Significant at 5 pc. level

ANNEXURE-X

Mean Sitting Height of Oriya and Maharastrian Girls

Age-Group	Oriya				Maharastrian				't'
	No	Mean ± (In cms.)	S. E. of Mean	Rate of Growth (In %)	No	Mean ± (In cms.)	S. E. of Mean	Rate of Growth (In %)	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
8—9 years ..	70	62·95	0·65	..	17	64·00	0·62	3·40	1·17
9—10 years ..	73	64·00	0·82	1·66	20	67·30	0·71	5·00	3·05*
10—11 years ..	75	66·10	0·30	3·28	12	68·71	1·61	2·20	1·74
11—12 years ..	72	68·08	0·25	2·99	16	72·74	1·18	5·80	3·88*
12—13 years ..	76	71·85	1·25	5·53	21	74·20	0·66	2·00	1·58
13—14 years ..	70	74·15	1·60	3·20	13	74·80	1·10	0·80	0·38
14—15 years ..	70	76·00	1·82	2·49	18	77·10	0·87	3·00	0·54
15—16 years ..	72	76·98	1·00	1·28	14	78·00	0·76	1·10	0·82

*Significant at 1 pc. level

ANNEXURE XI

Mean Biacromial Breadth of Oriya and Maharastrian Boys

Age-Group	Oriya				Maharastrian				't'
	No.	Mean ± (In cms)	S. E. of Mean	Rate of Growth (In %)	No.	Mean ± (In cms)	S. E. of Mean	Rate of Growth (In %)	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
8—9 years ..	70	25·00	0·35	..	16	25·05	0·53	4·9	0·07
9—10 years	75	25·20	0·80	0·80	12	26·30	0·44	4·8	2·34**
10—11 years ..	72	25·35	0·38	0·59	29	26·66	0·23	1·2	3·19*
11—12 years ..	70	26·05	0·18	2·76	18	27·00	0·31	1·4	2·79*
12—13 years ..	76	27·00	0·19	3·64	20	27·60	0·35	2·2	1·53
13—14 years ..	70	29·66	0·12	9·85	18	28·00	0·38	1·4	4·25*
14—15 years ..	70	30·90	0·30	4·18	20	31·00	0·32	10·1	0·23
15—16 years ..	72	32·44	0·42	4·88	18	32·80	0·43	5·6	0·61

* Significant at 1 pc. level

**Significant at 5 pc. level

ANNEXURE XII

Mean Biacromial Breadth of Oriya and Maharastrian Girls

Age Group	Oriya				Maharastrian				
	No.	Mean ± (In cms)	S. E. of Mean	Rate of Growth (In %)	No.	Mean ± (In cms)	S E of Mean	Rate of Growth (In %)	t
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
8— 9 years	70	24·62	0·62	—	17	25·10	0·24	4·0	0·60
9—10 years	73	25·00	0·48	0·72	20	26·00	0·32	4·3	1·78
10—11 years	76	26·82	1·00	2·08	12	26·82	0·58	2·2	1·13
11—12 years	72	26·95	0·82	5·60	16	27·70	0·32	3·3	0·86
12—13 years	76	28·95	0·90	7·42	21	29·70	0·46	7·0	0·75
13—14 years	70	31·00	0·28	7·08	13	30·90	0·72	3·9	0·13
14—15 years	70	31·85	0·63	2·74	15	31·20	0·57	0·9	0·77
15—16 years	72	32·00	0·60	0·47	14	32·50	0·64	4·0	0·61

ANNEXURE-XIII

Mean Stature of Different Groups of Boys

Age-Group	Oriya Urban (Present Study)			Punjabi Hindu Khatri (By Dr R Singh)			Maharastrian (By Dr J. Sharma)		
	No	Mean ± (In cms)	Rate of Growth (In %)	No	Mean ± (In cms.)	Rate of Growth (In %)	No	Mean (In cms.)	Rate of Growth (In %)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
8—9 years	70	122·00	..				16	121·27	4·8
9—10 years	76	124·10	1·72				12	126·63	4·2
10—11 years	72	127·40	2·65	50	139·30	..	29	130·61	3·2
11—12 years	70	132·00	3·61	50	144·09	4·13	18	134·00	2·6
12—13 years	76	140·20	6·21	50	150·65	4·48	20	136·40	1·7
13—14 years	70	151·20	7·84	50	155·39	3·21	18	140·80	3·1
14—15 years	70	156·00	2·51	50	159·28	2·49	20	151·40	7·3
15—16 years	72	156·20	0·77	50	165·07	3·96	18	159·70	5·3

ANNEXURE-XIV

Mean Sitting Height of Different Groups of Boys

Age Group	Oriya Urban (Present Study) No	Mean ± (In cms.)	Rate of Growth (In %)	Punjabi Hindu Khatri (By Dr. R. Singh) No	Mean (In cms.)	Rate of Growth (In %)	Maharastrian (By Dr. J. Sharma) No	Mean (In cms.)	Rate of Growth (In %)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
8-9 Years ..	70	63·85	..	..	..	..	16	63·78	2·30
9-10 Years ..	76	66·00	1·80				12	66·37	4·00
10-11 Years ..	72	67·50	2·22	50	66·80	..	28	68·17	2·60
11-12 Years ..	70	69·00	2·22	50	69·61	4·21	18	70·00	8·70
12-13 Years ..	76	72·50	5·07	50	73·40	5·44	20	72·08	3·90
13-14 Years ..	70	75·80	4·55	50	75·18	2·40	18	74·30	2·00
14-15 Years ..	70	77·00	1·58	50	76·89	2·30	20	76·50	2·90
15-16 Years ..	72	78·50	1·94	50	79·70	3·65	18	78·30	3·00

ANNEXURE XV

Mean Sitting Height of Oriya and Punjabi Hindu Khatri Boys

Age-Group	Oriya No	Mean ± (In cms.)	S. E. of Mean	Rate of Growth (In %)	Punjabi Hindu Khatri No	Mean ± (In cms.)	S. E. of Mean	Rate of Growth (In %)	't'
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
10-11 Years	72	67·50	0·36	2·22	50	66·80	0·61	..	1·10
11-12 Years	70	69·00	0·39	2·22	50	69·61	0·62	4·21	0·84
12-13 Years ..	76	72·50	0·32	5·07	50	73·40	0·55	5·44	1·25
13-14 Years ..	70	75·80	0·13	4·55	50	75·18	0·56	2·40	1·14
14-15 Years ..	70	77·00	0·39	1·58	50	76·89	0·61	2·30	0·15
15-16 Years ..	72	78·50	0·48	1·94	50	79·70	0·57	3·65	1·82

ANNEXURE XVI

Mean Bicristal Breadth of Different Groups of Boys

Age-Group	Oriya Urban (Present Study)			Punjabi Hindu Khatri (By Dr R Singh)			Maharastrian (By Dr J Sharma)		
	No	Mean (in cms.)	Rate of Growth (in %)	No	Mean (in cms.)	Rate of Growth (in%)	No	Mean (in cms.)	Rate of Growth (in %)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
8-9 Years ..	70	20·30	..	..	..	..	18	21·02	5·9
9-10 Years ..	75	22·00	8·3	..	..	..	12	21·63	2·9
10-11 Years	72	23·50	2·27	50	21·61		29	22·35	3·4
11-12 Years	70	23·19	3·06	50	22·65	4·40	18	23·00	2·4
12-13 Years ..	76	23·80	2·63	50	23·50	4·17	20	23·80	3·4
13-14 Years	70	25·15	5·67	50	24·09	2·51	18	25·00	4·9
14-15 Years	70	25·68	2·10	50	24·91	3·40	20	26·30	5·0
15-16 Years —	72	26·95	4·94	50	26·37	5·86	18	27·50	4·4

ANNEXURE XVII

Mean Weight of Different Groups of Boys

Age-Group	Oriya Urban (Present Study)			Punjabi Hindu Khatri (By Dr R Singh)			Maharastrian (By Dr J. Sharma)		
	No	Mean (In Kgs.)	Rate of Growth (In %)	No	Mean (In kgs.)	Rate of Growth (In %)	No	Mean (In Kgs.)	Rate of Growth In %)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
8-9 Years —	70	22·50	—	..	—	..	18	22·5	7·8
9-10 Years .	75	23·40	4·1	—	..	..	12	23·6	5·6
10-11 Years ..	72	23·90	2·36	50	23·70	..	29	25·3	6·2
11-12 Years .	70	27·00	12·7	50	33·38	16·31	18	26·5	4·7
12-13 Years ..	76	30·50	12·9	50	36·58	9·59	20	28·5	7·2
13-14 Years —	70	34·00	11·4	50	39·52	8·06	18	34·2	18·2
14-15 Years —	70	36·93	8·6	50	43·63	10·42	20	38·4	11·5
15-16 Years —	72	41·90	13·4	50	48·82	11·94	18	43·1	11·3

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Relational Structure of Sabara Women : A multiplex Network Analysis

R. P Sarma

The Sabaras are the fourth largest tribal community in Orissa, after Kondo, Gonds and Santhals[1]. Their references are found in the epics of Ramayana and Mahabharatha and it is believed that they are one of the ancient aboriginal tribes of this country. The Sabaras are known by different names in different parts of Orissa as Saura, Soura, Savara or Sahara. In their own language they call themselves "Sora" and their language as "Sora Langam". About 13 per cent of Sabara population of the State is found in the district of Koraput. They live in aboriginal conditions and modern civilisation has not yet made any impact on them.

The Sabaras are classified into two : Lanjia Sabaras and Sarada Sabaras. "Lanja" in Oriya language means tail. These Sabaras, both men and women wear a four inch wide piece of cloth in their loins hanging about eight inch long on both front and back side as tails, hence they are known as tailed Sabaras. In some regions they are termed as Malia or Jungle Sabaras. The Sarada Sabaras are little more civilised than the Lanjias, hence they call themselves "Sarada" or pure.

Objective of the Study :

The main objective of study of Sabara women in this paper is two fold. First to examine their family structure and economy as it is and analyse their economic activities concerning with their life style. Second, to make network analysis of their social structure with regard to (a) Family relation and the process of lending and borrowing among themselves, (b) collection and sale of forest products and (c) purchases for the family.

Sample Size :

The village Gadabang, 4 Kms. from the subdivisional town of Gunupur in the district of Koraput has been selected for the study. Even though the village is nearer to urban civilisation its impact on the Sabara community is very little. There is a Primary Sevashram School operating from 1985, a tube-well at the entrance of the village, and the village is well connected by a pucca road.

According to 1981 census the village consisted of 32 households with a population of 130. At present there are 51 families with a population of 203. At random 11 housewives have been sampled out from the four rows of houses consisting the total village for investigation. In the first round of the survey the basic data with regard to their family structure and economic activities were extracted with the help of the village teacher who speaks their language. On the second round the 11 housewives were again enquired about their contracts among themselves for preparation of networks. Name, age and marital status of the 11 sample women are presented in Table 1.

Family Structure

The Sabara families are smaller in size. The average family size is 3·90 persons. Of the 11 families investigated only three families have four children each and the rest have single child. On an average the number of children per family is less than two. Among the sampled housewives nine are from the families of the same village and two belong to other villages. Marriages are decided with the initiation of the female partner, parents generally never interfere, boys and girls are free to select their life partners.

1. Presented at the National Workshop on 'Development Needs of Tribal Women, 27 -29 March 1990 Gopalpur-on-Sea, Orissa.

TABLE 1

Family Structure of Sabara Women

Sl. No.	Name	Age	Marital status	Children	Infant Mortality
(1)	(2	,3	(4)	(5)	(6)
1	G dur	30	1	4	
2	Add	36	1	4	M
3	Labon	28	1	I	M
4.	Mangid	40	4		
8	Body	27	1	1	M
6.	Adm	43	W	4	
7	Dengun	30	S	t	M
8.	Sambalv	21	1	1	
9	M n	60	1	1	M
10.	Loss.	8	1		
11	Thuba	25	2	t	

W: W do v 1 First marriage, 2. Second marriage S: Tw. wives. M Mortality

The women when select their partners prefer younger lads than their age. The sample investigation shows that the mean age of the husbands is 28 years in comparison to wives' 34 years. The range of age difference is as wide as 25 years.

Eight housewives have thin gold rings in their nose and silver rings in the upper ears. They were given these ornaments at the time of marriage by their parents. No housewife purchased any other ornament since their marriage. These eight ladies have large holes in their ears without any ornaments. Previously they were using buds prepared of a particular wood as ornaments; as one set of buds become loose for the ear holes they were being replaced by another set of buds with higher diameter, and in the process the ear holes become very large. The younger maids to-day neither use wood buds nor other ornaments in their ears.

Cultivation

The Saboras are not accustomed to settled land cultivation and most of these tribals in the interior area still have no settled land cultivation. Only few families in the village have settled land cultivation, which are provided by the Government by clearing the forest. Two of the sampled families have converted the dry land provided by the State into fields suitable for cultivation of paddy. The Saboras of this village do not use any standard agricultural methods for cultivation. They still use the archaic method of loosening the earth with hand implements, throwing seeds on it and then turn up to the field only at the time of harvest. In the entire village there are two pairs of bullocks for the purpose of cultivation provided under the I. R. D. P. scheme of Government of Orissa, recently. The average settled land holding of the sample families is 1.69 acres and yield of paddy is only 1.03 quintals per acre.

Shifting cultivation is the way of life for the tribals and so to say it is the main occupation of the Saboras. This type of cultivation known as "Podu" locally is operated on the slopes of the nearby hills. The area of Podu land per family ranges from 1.5 to 4.5 acres. The area depends on the ability of the family members to clear the forests. Both men and women work together for all Podu operations, even the single widows take up Podu on their own. On Podu land mainly maize locally known as "Jonna" is cultivated, which is their staple food. Rice meal is taken occasionally which is regarded as luxury. They grow an arhar variety called "Kandul" on both plain and podu land which is a good cash crop. The yield of maize on podu land is also very low. It is around 40 Kgs. per acre. On the basis of requirement of one Kg. of rice/Jonna per individual per day, the total agricultural production from the plain and podu land supports a family of four for about three months in a year.

Collection of Firewood

Collection firewood is the main occupation of the Sabara women which provides them minimum sustenance throughout the year. Both men and women collect firewood but the collection of Mahua flowers is done exclusively by women and children. Mahua flowers are mainly stored for preparation of wine throughout the year only if there is any surplus it is exchanged for vegetables and household purchases. One head-load of firewood collected by women is sold at Rs. 8, while two loads on balance over the shoulder of a man gets twice the value of a head-load.

Pattern of Consumption

The Sabara families live very simple life. Daily food requirements are limited to the three following items only. This is the average daily

expenditure for a family of four, which includes two children. On this estimate a family's annual expenditure comes to Rs. 2,300 only

Maize 3 Kgs.	..	Re. 6·00
Salt	.	Re. 0·25
Chillies	..	Re. 0·25
Total	.	Rs. 6·50

The Saboras are not accustomed to vegetable curries, and occasionally take beef by boiling it with salt. Both men and women never use upper garment, while in the village. When they go to the town the women folk cover their bust with a chader or wear a blouse. One piece of blouse is being used for several years. A two meter piece of cloth is worn by the women above the knee. They are not using any light in their houses. They take their night meal after dark near the hearth under the dim light of the fire wood. The younger generation of girls now use frocks Ghaggara and Choli. Many young men now switched over to wearing half pants instead of cloth

SOCIAL NETWORK

In a community the social and economic relations are interlinked and each influence the other. An individual typically participates in a social system involving many other individuals who are significant reference points in one another's decisions. The nature of relationships a given member has with the other system members affect an individual's perceptions beliefs and actions. Development of a community mostly depend on social behaviour than on economic inputs. The use of economic inputs must be on the basis of social behaviour at a point of time. Social behaviour can be analysed either on the basis of attributes or on the relational perspective, but so far the former approach has been utilised by the social scientist to analyse the socio economic behaviour of a community. The two approaches are not mutually exclusive but complementary to each other. Relational measures capture emergent properties of a social structure that cannot be measured by aggregating the attributes of individual members.

In this paper an attempt has been made to prepare a set of these sociograms on the basis of net work of social relations. The first sociogram indicates a relational network among the 11 Sabara women based on frequent lending and borrowing of food grains and other materials of household use. About 50 per cent of the net work actors, the sample women, have family relationship in one form or other. The inter-relationship among the 11 actors is presented below in the form of an Adjecency Matrix K

This is a binary matrix of relations such that $x_{ij}=1$ if there is an edge of relation and 0 if there is no edge between them. The V's, 1 to 11, are the network members. The number of 1's in the corresponding row or column of the matrix indicates the degree of the member or actor. Higher the degree of an actor more is the popularity of the actor in the net work structure

	V_1	V_2	V_3	V_4	V_5	V_6	V_7	V_8	V_9	V_{10}	V_{11}
V_1	0	1	0	0	0	0	0	1	0	1	0
V_2	1	0	0	0	0	1	0	1	0	0	0
V_3	0	0	0	0	1	1	0	0	0	1	0
V_4	0	0	0	0	1	1	0	0	0	0	0
V_5	0	0	1	1	0	1	1	0	0	1	0
V_6	0	1	1	1	1	0	1	0	0	1	1
V_7	0	0	0	0	1	1	0	0	1	0	0
V_8	1	1	0	0	0	0	0	0	0	0	0
V_9	0	0	0	0	0	0	1	0	0	0	0
V_{10}	1	0	1	0	1	1	0	0	0	0	0
V_{11}	0	0	0	0	0	1	0	0	0	0	0

As it can be verified from the matrix the actor 6 has the highest degree of 7, that is, it is directly connected to the 7 of the 11 members in the network. The graph of the network is presented in figure 1. The number inside the circle indicates the serial number of the sample woman given in Table 1 above.

The density of this network is 0,31, which is a ratio of actual linkages to the total number of possible linkages in the network. In this network the total number of possible relations are 55, but the actual relations are 17. Higher the density more closely the members of the network are related. A clique is a closely connected sub-graph or a social circle in a network. Six cliques can be identified in fig. 1, in the form of triads. They are (1,8,2,) or (10,3,6,), (3,7,5), (4,5,6), (5,6,7), and (10,6,5). Since a clique is a closely related social circle any one of the cliques can be selected for injection of new ideas and concepts to be spread in the entire network.

The second sociogram is based on the social linkages with regards to the main economic activity. The main economic activity of the village is collection of fire wood from the forest and sell these in the town. Cutting and sale of fire wood are mostly done on the same day. The second network of social relations in their main economic activity is presented in figure 2.

The second network is in several ways different from the first. The first one is a planar graph while the second is a non-planar one. A graph that cannot be drawn on a plan without a crossover between its edges is called a non-planar graph. In the figure 2, the edges between the actors 2, 5 and 4, 6 cannot be drawn without the crossover. The density of the network remaining same the structure of the second network is a different one. In the second network there is one isolated member No. 8; which is not linked with the rest of the network members. Actor 3 is a pendant vertex, that is, it is linked to a single member of the network in the second sociogram in comparison to its position of degree 3 in the earlier network.

The third sociogram is prepared for analysis is based on the household purchases. Both for the purchases made inside the village from the peddlers and for the marketing in the town linkages are established for the third network. Since the purchases are very few the relational structure is also simple and limited. This network is presented in figure 3. This third network is a different one from the earlier two. Graphtheoretically the first two networks are same because it contained same number of vertices and edges, eventhough they are different in structure; but in the third network the edges or linkages are fewer. Hence the density of this third network is 0·20. In this network there are two isolated members, 9 and 11.

Reachability

Reachability is another aspect of network analysis a social scientist uses to manipulate the behaviour of the network members. Though how many steps or links an actor is reachable in the network is the main concern of the network analyst. In a complete network, i.e., when all the network members are directly linked with each other, any member can be reached with a single link. But in the lower density networks reachability requires more than one step.

A three step reachability matrix has been compiled for the first sociogram below

$$K^3 = \begin{bmatrix} 6 & 3 & 3 & 3 & 3 & 3 & 4 & 0 & 7 & 2 \\ 2 & 3 & 1 & 6 & 10 & 1 & 4 & 1 & 3 & 0 \\ 3 & 8 & 4 & 11 & 13 & 4 & 2 & 2 & 8 & 2 \\ 1 & 4 & 2 & 9 & 11 & 2 & 1 & 2 & 4 & 1 \\ 5 & 11 & 9 & 10 & 13 & 10 & 2 & 1 & 12 & 4 \\ 10 & 13 & 11 & 13 & 10 & 12 & 2 & 1 & 15 & 7 \\ 1 & 4 & 2 & 10 & 12 & 2 & 1 & 3 & 4 & 1 \\ 4 & 2 & 1 & 2 & 2 & 1 & 2 & 0 & 2 & 1 \\ 1 & 3 & 2 & 1 & 1 & 3 & 0 & 0 & 2 & 1 \\ 3 & 8 & 4 & 12 & 15 & 4 & 2 & 2 & 6 & 2 \\ 0 & 2 & 1 & 4 & 7 & 1 & 1 & 1 & 2 & 0 \end{bmatrix}$$

Each element in K^3 matrix indicates the number of three step paths through which a member is reachable from another member. For instance $K_{23}=8$; this indicates that the members 2 and 5 can reach each other in three step links in five ways. From the network No. 1, it can be verified that the five paths are —

$1(e_3, e_6, e_8)$, $2(e_2, e_{10}, e_{11})$, $3(e_3, e_7, e_{12})$, $4(e_1, e_5, e_8)$, $5(e_3, e_{15}, e_{16})$.

The zero elements in the matrix show that two members in the network cannot reach each other in three step links.

Network Multiplexity:

A network compounded of two or more types of relations is called a multiplex network. In this paper three separate networks have been worked out for the 11 sample Sabara women of Gadiabeng. A synthesis of the three networks is presented below as a multiplex network. The members of the network who are linked in the similar way in all the three networks are naturally more influential in the community, and a social scientist takes up these active members for the initiation of development process.

The multiplex matrix of the three networks is given below:—

$$M = \begin{bmatrix} 0 & 1 & 0 & 0 & 0 & 0 & 0 & 1 & 0 & 0 & 0 \\ 1 & 0 & 0 & 0 & 0 & 1 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 0 & 1 & 1 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 1 & 0 & 1 & 0 & 0 & 0 & 0 & 0 \\ 0 & 1 & 0 & 1 & 1 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$$

The relations presented in the above matrix show that these relations are common to all the three sociograms presented earlier. How the multiplex network is different from the rest of the three networks can be visualised if it is seen in a graph form. This is shown in Fig. 4. This multiplex network is a disjoint one. There are three isolated members, 7, 9 and 11 who are not connected to the network. There are two sub graphs, the largest with 6 actors and the smallest one with only two actors. In the larger sub-graph there is one clique with three members, viz. 4,5, and 6. these three are the most influential in the entire network of Sabara women in the village.

Conclusion:

The study reveals the following facts, on the basis of which we have to evolve a strategy to develop the tribal community in general and their women in particular.

(1) The Sabara community is at an ultra-under development[2] level. The Planning Commission in 1985 put the cut-off point of Rs. 6,400 of household income for the identification of poverty line. This amount now stands at Rs. 8,500 calculated on the basis of average 6·6 per cent increase in price index during the 7th Five-year Plan Period. As there are no savings or borrowings of any significant nature, the daily household expenditure of Rs. 8·50 can be accepted as household income of these Sabara families. Accordingly each Sabara family has a total annual income of Rs. 2,300. This means the poverty of a Sabara family in the village is down 75 per cent below the cutoff point.

(2) There is a primary school in the village since 1985 but literacy is zero. There is a tube-well but the water is not used by the villagers. There is a pucca road connection from the town and a local bus operates twice daily through the village but so far modernity has not touched villagers.

(3) The Sabara women are dominant in the family system and contributes equally to the family income alike their husbands. There is no complete social network among the Sabara women as it is commonly believed, but there are many social circles inside the networks. The network densities are low, but it is higher than the network densities of urban communities.

Suggestions :

As it shows that there is very meagre impact of modernisation on the Sabara community in spite of several planned strategies of rural and tribal development evolved and experimented by our planners since 1951. My suggestions may be regarded as further addition to the strategies already there in sufficient number, but I feel these are worth for an experiment.

(1) There is a school, two teachers have been working there since last 25 years but there is not a single adult who can sign his or her name. The 1981 census records show that the literacy of tribals in Orissa is 13·95 per cent. Assuming that the tribal literacy was zero in 1951, it shows that during the last 30 years only about 14 per cent of the tribals could be made literates. The children are not being sent to the school because the parents feel that the education is of no use to the family immediatly, instead they prefer to engage them in the household work which is believed to be more productive. Further it is found that the children are not at all interested to learn a "foreign" language o other than their mother-tongue which is neither spoken nor understood by anybody in the village. I suggest that the Sabaras may be taught in their own language through Oriya alphabets in order to increase the educational level of the community. There is no need to develop a separate script for the Sabara language to add to the eleven type of scripts we are having in India today, they can be taught in their language through Oriya script easily. Both the parents and children would be more interested in their process of education. Once they know the the Oriya script gradually they will be attracted to learn Oriya when they realise that it is necessary for them. The estimated Sabara population now is about 4·5 lakhs in the State. Hence a suitable education programme may be developed for the Sabaras in their own language.

(2) Most of the school teachers today in the tribal villages neither attend school and even if they go occasionally, nor reside in the village with family. Instead of a teacher a multipurpose worker may be appointed to do the job of a teacher, health and medical visitor and a development worker concerning the village. The teacher should be given necessary training in the respective field and more important is that he should stay in the village itself with family.

This will have a good demonstrative effect[3] on their pattern of consumption and attitude towards life.

(3) The network analysis shows that there is a strong social circle among the Sabara women in the village. Out of 11 sample woman, 27 per cent, that is three women, viz Mangdi, Body and Adau -the numbers 4, 5, and 6 in the networks—form a strong social circle. Economic development requires a change in the way people think, feel and act[4] Development as an objective and development as a process both embrace a change in the fundamental attitudes to life and work[5] If the closely related three Sabara women are motivated and their outlook influenced it will spread to the entire community through the social networks. Development cannot take place if there is no urge for development. Lack of interest in material advance[6] seems to be one of the main reasons of under development of these aboriginal tribes. When these Sabara women were asked about their requirement for their improvement, four of them told to provide land for cultivation and the rest reluctantly expressed ther they need money to repair or construct houses. Nobody demanded any mordern amenities or household goods for their family Unless aspirations are aroused among the Sabara community for development, spoon feeding of projects by dumping money cannot make any headway to develop them. They have to be motivated through the initiation of a social circle, especially through the women folk of the community. This approach may be slow, and the desired results may not forthcome immediatly, but once caught up the community will be progressed rapidly We have lost 40 years expecting quick results and once we stop expecting quick result initially, the new approach will get unexpected results.

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Figure 1

Lending—Borrowing Network

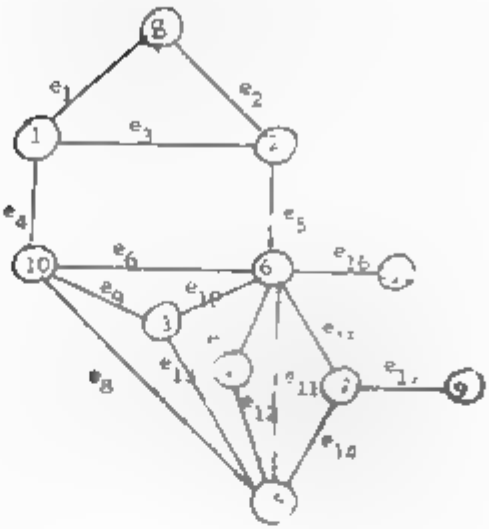


Figure 2

Network of Economic Activity

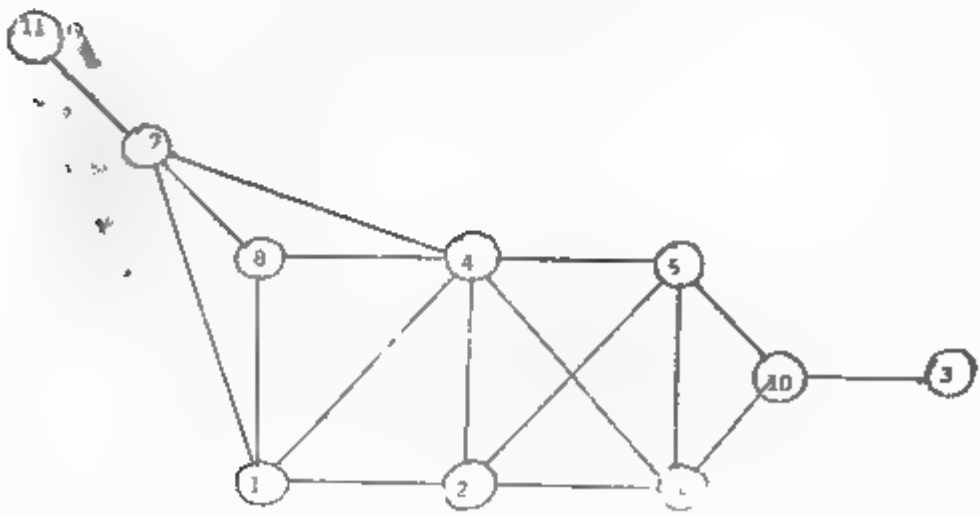


Figure 3
Network of Marketing

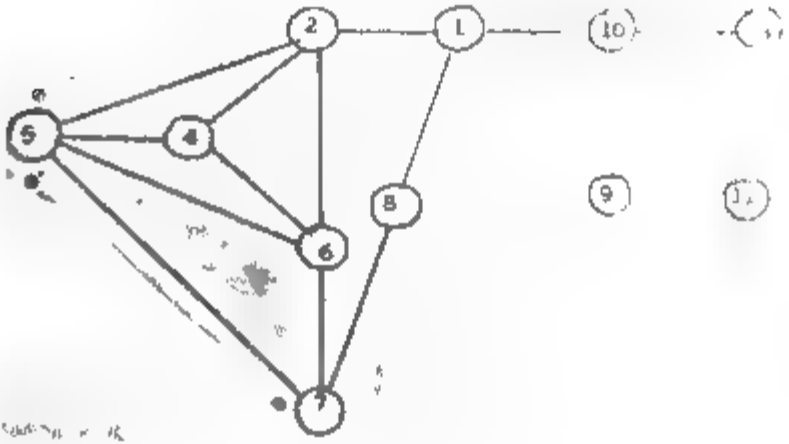
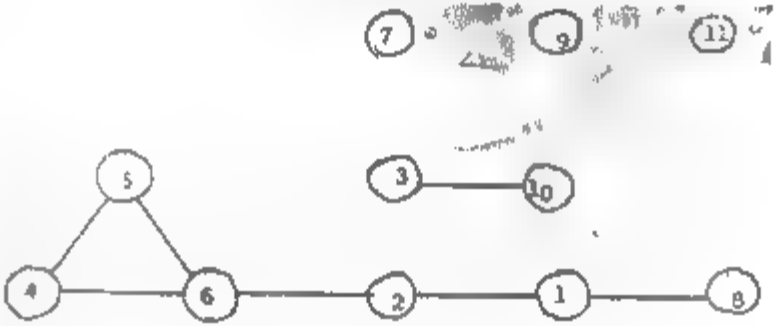


Figure 4
Multiplex Network



Oath and ordeal in Khond society of Nineteenth Century Orissa

N. R. Patnaik

The Khonds or Kandhs belong to one of the principal aborigines of the hills of Orissa and the neighbouring districts. In the nineteenth century they dwelt in an extensive area stretching from the western limit of Gondwana to the Bay of Bengal, and from the Mahanadi river on the north to the Godavari on the south.[1] Their area included the hills separating the districts of Ganjam and Vizagapatam in the Madras Presidency and continuing northwards into the Orissa Tributary States of Baud, Daspalla and Nayagarh, and crossing the Mahanadi, into Angul and the Khondmals. Their area was also extended further into Central Provinces covering northern part of Kalahandi and the south of Patna.

Oath and ordeal constituted a redeeming feature in the khond society. Those were mostly used for settling the disputes. The disputes regarding property and offences of all kinds were adjudicated by the council of elders, who heard both parties and examined witnesses.[3] And the oath and ordeal played vital roles at the time of trial.[4]

The Khonds had numerous types of oath or ordeal. One such oath has been described by J. A. R. Stevenson. That is as follows.

"The subject of the circumstance is first repeated by the swearing party and a basket containing the following things is held before him. 'A blood sucker (Lizard), a bit of tiger's skin, a peacock's feather, earth from a white ant hill, rice mixed with fowl's blood a lighted lamp. He proceeds with his oath touching each object in the basket at that part of the oath which refers to that object. 'Oh' father (God), I swear, and if I swear falsely then, Oh, father may I became shrivelled and dry like a blood sucker, and thus die. May I be killed by a tiger. May I crumble to dust like this white-ant's hill. May I be blown about like this feather. May I be extinguished like this lamp' While saying the last words, he puts a few grains of rice in his mouth, and blows out the lamp, and the basket with its contents is made to touch the top of his head."[5] Thus the litigants and witnesses were examined on oath.

One of the most sacred ordeal tests of the Khonds was founded on the belief that rice steeped in the blood of a sheep* sacrificed in the name of the Earth Goddess would, if eaten by litigants, destroy the perjured and that a portion of the disputed soil made into clay would, if swallowed by them have a similar effect.[6] It was believed that they would be attacked by some fatal illness within seven days.[7]

C. H. Mouney, the Special Assistant Agent of Ganjam in his report of the 10th October 1883 has revealed some of the valuable informations regarding the oath and ordeal of the Khonds. He writes that the four kinds of oaths were used for judicial disputes. Of those one oath was used to induce secrecy. The most solemn form of the first kind of oath was called the oath on Tiger's skin. Such an oath was taken in the following way. A piece of land was to be smeared with cowdung and rice sprinkled on it on this land of Tiger and Cheetah skin, some leaves of the Tulsi plant, some leaves of one of the arum plant (Saru plant) some earth from a white-ant heap and (if the oath was about a land dispute) some of the earth from the spot in question were placed. The men who took the oath would come forward. Lifting the skin with the other things on it and addressing himself to God he would say, "if I am not speaking the truth or if I do not point out this boundary truly (as the case may be) may I be

distroyed by a tiger may my limbs be withered like this Tulsi plant within, may my throat blister to cause my death as if this Saru plant was appealed to and may white ants eat my body as they do to wood and if it is a land case may I be destroyed and my body mingled with this earth [7]

The ordinary form of oath for petty land disputes was known as 'drinking or eating the earth'. In this oath, seven handful of earth was to be taken from the land contested about. Such earth was to be mixed with water. Then this mixture was to be drunk by the man who claimed the land. At the time of drinking the man was to say that his family belongings would meet death and destruction in three days if he was perjuring himself [8]

The third form of oath used in land disputes has been given by C. H. Mouney. One who would take oath was to walk round the boundary of the land that he claimed. He then advanced to the centre of the land where the headman had already assembled. There a mixture in a cup was to be kept. This cup made of the Sal leaves. Seven leaves of the 'Chaturam were tied together and these were to be chopped every time when placed over the cup so that each piece would fall into the mixture. Before he drank this mixture—a Khond priest was to break a fowl's egg and offer it to Goddess. Then the mixture was to be swallowed by the man invoking the God of rain that He would allow him to live if he was speaking the truth. On the other hand He would make him die within seven days, if he was perjuring himself. Then he was watched for the said period. If nothing would happen to him he would win the case [9]

The fourth solemn oath used for land disputes was the recognized form by which a man might clear his character from the charges of 'Pulto Bagha' and seduction. When men and women acquired the power of changing themselves into tigers, they were called 'Pulto Bagha'. This he or she did to destroy the enemies. The oath for it, was taken with the earth mixed with salt from a white ant heap, holding the leaves of the 'Olua' and a Tangi. One was to put the Tangi blade between his teeth and touching the other things took oath that if he was perjuring himself he might be dissolved like salt in water, eaten up by white ants so that there would remain nothing of him to be burnt, wither as the 'Olua' leaves, and he cut into little pieces by Tangias. Sometimes they used to swear holding peacock's feather with the belief that those were used as fans of the deities [10]

The Khonds used to believe that a false oath taken on the potter's wheel would cause lunacy. Likewise if an oath was taken in the field with the standing crop that would cause the death of the thief [11] A simple offering of liquor to the Earth Goddess was frequently made to ratify an oath or a promise. The oath, which was to be administered in the courts, embodied all the older forms. A tambi, the standard measure, some salt paddy, rice, cat's fur, the leaves of the broom plant and earth from an ant-hill were placed before the witness. He was made to repeat the names of the contents and swear to tell the truth. [12]

Macpherson has mentioned three kinds of ordeals such as piercing hands into boiling water, hot oil and heated iron. Besides these there were other ordeals too. Those were immersion in water, a contrivance with bamboo and the like. [13]

In case of the boiling water ordeal, a new earthen pot was to be filled with water mixed with a handful of cow-dung. The pot was then placed over the fire till the water boils. The suspected man was either to plunge his hand and wrist into it when it was still over the fire. Sometimes he was asked to bring out some articles dropped to the bottom of the pot. At that time the Khond priest was to sit by his side. He would invoke Earth-Goddess for the occasion. If his hand was not found scalded he would be declared innocent. The ordeal by hot oil was to be carried out in the same process [14]

Yet the hot iron ordeal was of two types. In the first one, a squarish lamp of iron was heated till it turned red hot in a fire. Then a priest was to sprinkle rice over it, one handful rice was to be thrown in the name of each suspected men. If the iron would smelt, while shouting one name then he was to be found guilty. The second method of testing innocence was to make a piece of iron red hot in similar way. That one was to be placed on the back side of the palm of the accused. A stick was to be placed in between the palm and the iron. If neither the sticks nor his palms would be found burnt, then he was to be declared innocent. If not, he was to be declared guilty [15]

The ordeals by immersion in water were of two types. In the first type, the complaint and defendant would be asked to go to the middle of a stream or pool and sit down so that they were completely submerged. The man who would be found keeping his breath for the longest period would be adjudged truthful.[7] In the second type, only one man was to go into the water. Then the Khond priest would invoke the God of Rain. This being done he poured out little of milk on the surface of the water. If the milk would float, he would be declared truthful. On the other hand if the milk would sink he would be considered a liar.[8]

Another ordeal was still more inhuman. Here one was required to step over the burning logs. A large piece of tamarind wood was to be kindled. When the log would be red hot its piece were to be scattered over nearly four yards of ground. The man to prove his innocence generally in case of theft was required to walk over those logs without getting himself burnt. Before he stepped over he used to pray God telling to scorch his feet if he was guilty and make him escape unburnt if innocent. In some places like Ghumsar the man's feet were to be first dipped into oil before he started to walk."[9]

In this context Barbara M. Boal has given a description of one such ordeal by walking on the fire trench. That is as follows

In the case of adultery, witchcraft or sorcery, an ordeal was to be faced. If a husband accused his wife of consistent adultery she was asked to justify herself innocent by an ordeal. "Walk the fiery trench", the husband used to say his accused wife and in reply she used to say, "All right, I will". Then she would go to her parents' home and tell the whole story. Then a dialogue between her and the parents takes place. Her parents said: "If you have not committed adultery we will undertake this ordeal". She declared strongly: "I have not become adulterous". Then the preparation for the ordeal takes place. The head of the sick bewitched person's house or the father or kinsman of the adulterous woman appears before the village council. Then if the accuser says "You must undergo trial by ordeal. I will scatter the rice grains for you. If the fire does not burn you, I will give you a buffalo, rice, metal pots and rupees for my shame's sake moreover I will bless you". Thereafter that evening one or perhaps two men of the accused's kinsmen would collect some rice and an egg. Next morning without looking to any woman's face those two men would go up the hill (to the forest) and offer the rice and egg with invocation. Then they would cut down a large dried up branch of a Sal tree. They would carry the same on their shoulders and join their kinsmen. They put the wood down where the trench was to be dug outside the accuse's village boundary. One man would provide a small and large pickaxe and a new winnowing tray. They would go to bathe and return in their damp clothes. They would then dig the fire-trench. Beside the fire-trench they would light the fire. When the embers would look red hot the people of both the sides would gather and listen intently twice to the accuser's charge. One of the women's (or sorcerer's) kinsmen who had bathed ritually would stand near the trench. Holding some rice he would invoke Bura Pannu[10] and scatter the rice. He would anoint his feet with castor oil and put seven Pipal leaves under his feet, winding them round with new thread. Then he would lift his battle axe to his shoulder give a 'Johar!' greeting to all deities on four sides and then step in to the trench. He would walk through the fire seven times, while another man would keep on fanning it with the new winnowing tray. If he could not manage seven times he would come out quickly. Then the people could know that the woman (or sorcerer) had committed the misdeed. If she/he would be innocent nothing would happen to him. They said, "She/he (as the case may be) has not done wrong. You have been accused without cause". Then immediately they would give the promised buffalo and rice. The woman would go to father's house and stay for a while. Afterwards her husband would come to take her back home.[20]

Yet the ordeal by bamboos was different in character. But it was rarely applied. Two bamboos with six feet long each were to be cut. On the man whose innocence or guilt was to be determined three bamboos were to be placed horizontally touching his right and left arms. Those were to be tied with bamboos. Then he was to invoke God so that the charges against him may be cleared. If he was innocent he would be free from his wooden binds.[3]

There were yet two other ordeals which were of different nature. Those were usually applied to boundary disputes. The ownership of the land was to be proved or disproved by the conduct of a fowl belonging to one of the

parties. This fowl was to be tied to the boundary pe in dispute. If it would remain quiet there, eat and sleep as usua the owner of the fowl would be believed to have spoken the truth. On the other hand if t would flutter and try to get away from where it was tied up he would lose his case. The other method was to fix an a row on the a leged boundary line. Then the Keond Priest would pour rice exactly on the top of the arrow. The side on which the longest heap of ice would accumulate would be taken as the boundary of his land.[22]

Thus there were several peculiar oaths and ordeals prevalent n the Khond society of the nineteenth century.

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** Invocation "

"O High Bura God !

We are understand ng this ordeal to jus fy our daughter

If our daughter has sinned

May I be burned as I walk this trench

If there is no sin may I not be burned"

20. Barbara M Boal, *The Konds* (Warminster 1982) p. 14-15

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Distribution of the ABO blood groups among the Mahato of Mayurbhanj district

Renupama Mohanty

Introduction

Originally, the Mahatos were a tribal group. After 1901 census, they have been regarded as a Caste (Kurmi Mahato or Kurmi Kshatri) group found in the Keonjhar and Mayurbhanj districts of Orissa, Midnapur district of West Bengal, Ranchi and Singhbhum districts of Bihar and also to some extent in some parts of Uttar Pradesh.

As regards the origin of the Mahato group various authors give different hypothesis. As such a group of authors ascribe them as originated from Dravidian people whereas others like Russell have opined that Mahato a representative of an agricultural tribe recruited from some aboriginal and non-aboriginal tribes like the Kombis of the Mahratta territory with whom they generally marry. However today they have been segregated from these tribal ancestors and considered as a Hindu caste with lower caste status.

When their morphological features are studied, a great diversity is noticed. We find people with dark-brown skin, short to medium stature, thin to medium lips and hair colour varies from medium brown to black. The hair form is straight to wave and curly with marked cheek bones and prominent chin.

Material and Methods

Samples were collected from 169 individuals, randomly selected from villages like Pratappur, Badajodo, Itamatia, Rangamatia, Sunamuhi around Baripada town of Mayurbhanj district.

The blood samples were collected on the slide in the field using the standard procedure (Race and Sanger, 1975). Antisera were procured from Haffkine Institute, Bombay. Gene frequencies were calculated using Bernsteen's corrected method.

Result and Discussion

The distribution of ABO blood groups in the present study is given in Table 1 which shows that blood group of predominants (42·0%) followed by group O (34·3%), B (17·2%) and AB (6·5%).

A comparison (Table 2) of the present data with Mahato of Keonjhar shows an intermediate position regarding ABO distribution. The frequency of A is lowest when compared with work reported by P. Parija, although, these differences are not statistically significant showing that probably the Mahato of Keonjhar and Mayurbhanj are of the same parental stock.

Table 3 shows the comparison between the Mahato and other tribal groups. The X^2 values shows non-significant differences between Bhumij ($X^2 = 3·92$) of Mayurbhanj district, Santal ($X^2 = 4·58$) and Juang ($X^2 = 2·29$) of Keonjhar district. But statistically significant differences have been found with Bhumia, Didayi and Bathudi.

This study thus reveals that the Mahato are Serologically alike with Santal, Bhumij tribe of Mayurbhanj district in the ABO blood groups. Non-significant difference with Didayi, Bhumia and Juang might be an off-shoot of the same parental stock.

Table 1

Distribution of the A B O blood groups of the Mahato

	O	A	B	AB	Total	General frequency
Number —	58	71	29	11	169	p=0·282 q=0·193
Observed —	34·3	42·0	17·2	6·5	100	r=0·508

Table 2

Phenotype frequences in Mahato of Mayurbhanj and Keonjhar districts

Population	100	O	A	B	AB	References
Mahato (Mayurbhanj) ..	169	34·3	42·0	17·2	6·5	Present Study
Mahato (Keonjhar) ..	134	32·4	44·5	16·6	6·5	P. Parija (1975).

Table 3

Comparison of Mahato with neighbouring tribal groups

Population compared with Mahato	Author and year	Place	X^2
Santal —	R. Mohanty, 1982 ..	Mayurbhanj ..	3·90
Bhumij ..	R. Mohanty, 1982 ..	..	2·61
Didayi —	J. Mishra, 1972 —	Koraput —	7·98
Juang —	Sarkar, 1958 ..	Keonjhar ..	9·42
Bhumiya —	S. Mohanty —	Koraput —	10·87

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